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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,898	09/14/2006	Hans Zou	US040151	4318

24737 7590 09/11/2008
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
LOVELL, LEAH S	

ART UNIT	PAPER NUMBER
2885	

MAIL DATE	DELIVERY MODE
09/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/598,898	ZOU ET AL.	
	Examiner	Art Unit	
	LEAH S. LOVELL	2885	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2006 and 04 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 April 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *14 Sept 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *Machine translation of JP2000-294831*.

DETAILED ACTION

The preliminary amendment filed 9/14/06 has been entered.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 6 recites the limitation "the first surface" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. Furthermore, since "the first surface" is previously undefined it is unclear which surface has the refractive index matching material.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 5, 6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Yanagase et al. (JP 2000-294831).

Regarding claim 1, Yanagase discloses an illumination device, comprising:

an incoherent solid state light source [92; 106, 107, 108] adapted to emit light over at least one light emission surface and having a total light emission surface area S_o [see figure A below]; and

a reflective cavity [50] having an entrance aperture adapted to receive the light from the incoherent solid state light source and a light extraction aperture adapted to output the light from the incoherent solid state light source [see figure A below],

wherein a surface area S_i of the light extraction aperture of the reflective cavity is smaller than the surface area S_o [see figure A below].

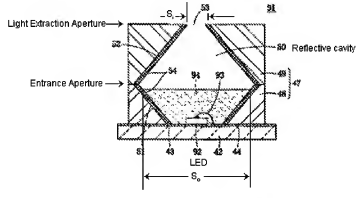

FIGURE A: Figure 12 of Yanagase modified to clearly indicate portions of the illumination device.

In regard to claim 2, Yanagase discloses the incoherent solid state light source [92] consists of a single extended LED [figure 12].

Regarding claim 3, Yanagase discloses the incoherent solid state light source [106, 107, 108] comprises an array of LEDs [figure 15].

Regarding claim 5, Yanagase discloses an illumination device, comprising:

an incoherent solid state light source [92; 106, 107, 108] adapted to emit light over at least one light emission surface and having a total light emission surface area S_o [Figure A above]; and

a reflective layer [50] disposed directly on and covering the incoherent solid state light source [figures 12 and 15] and having therein an opening [53] for outputting the light from the incoherent solid state light source,

wherein a surface area S_i of the opening of the reflective layer is smaller than the surface area S_o [figure A above].

In regard to claim 6, as best understood, Yanagase discloses a refractive index matching material [94, 109] disposed on an area of the first surface that is not covered with the reflective layer [figures 12 and 15].

In regard to claim 8, Yanagase discloses an illumination device, comprising:

an incoherent solid state light source [92; 106, 107, 108] adapted to emit light over at least one light emission surface and having a total light emission surface area S_o [see figure A above];

a light circulation device [49, 50, 52] including at least one light receiving surface adapted to receive the light from the incoherent solid state light source, and a light extraction area having a surface area S_i [see figure A above] and

light extraction means for extracting the light from the light circulation device at the light extraction area, wherein S_i is smaller than S_o [see figure A above].

In regard to claim 11, Yanagase discloses the light circulation device [49, 50, 52] comprises a hollow cavity [figures 12 and 15].

5. Claims 1-3, 5, 8-15, 17, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Zimmerman et al. (US 6,869,206).

Regarding claim 1, Zimmerman discloses an illumination device, comprising:

an incoherent solid state light source [106] adapted to emit light over at least one light emission surface [112] and having a total light emission surface area S_o [103; 423]; and

a reflective cavity [426] having an entrance aperture [430] adapted to receive the light from the incoherent solid state light source [106] [figure 11] and a light extraction aperture [432] adapted to output the light from the incoherent solid state light source [106] [figure 11],

wherein a surface area S_i of the light extraction aperture of the reflective cavity is smaller than the surface area S_o [figure 11 clearly shows S_o greater in size than S_i].

In regard to claim 2, Zimmerman discloses the incoherent solid state light source [106] consists of a single extended LED [figure 3B].

Regarding claim 3, ZImmerman discloses the incoherent solid state light source [106] comprises an array of LEDs [figures 4B, 5B, 6B, 7B, 8B, and 9-15].

Regarding claim 5, Zimmerman discloses an illumination device, comprising:

an incoherent solid state light source [106, 422] adapted to emit light over at least one light emission surface [112] and having a total light emission surface area S_o [103; 423]; and

a reflective layer [top surface of the housing 422 wherein the opening 424 is found] disposed directly on and covering the incoherent solid state light source [figure 11] and having therein an opening for outputting the light from the incoherent solid state light source [figure 11],

wherein a surface area S_i of the opening of the reflective layer is smaller than the surface area S_o [figure 11].

In regard to claim 8, Zimmerman discloses an illumination device, comprising:

an incoherent solid state light source [106, 422] adapted to emit light over at least one light emission surface [112] and having a total light emission surface area S_o [103; 423];

a light circulation device [426, 446; 300] including at least one light receiving surface [430; 303] adapted to receive the light from the incoherent solid state light source, and a light extraction area [432; 304] having a surface area S_i; and

light extraction means [452, 512; 426; area outside of the light circulation device] for extracting the light from the light circulation device at the light extraction area, wherein S_i is smaller than S_o [figure 11 clearly shows S_o greater in size than S_i].

In regard to claim 9, Zimmerman discloses the light circulation device [426] comprises a solid light guide [column 13, line 60-column 14, line 4].

Regarding claim 10, Zimmerman discloses the light circulation device [426] further comprises a reflective material disposed on a surface of the light guide which does not support total internal reflection [column 13, line 67-column 14, line 2].

In regard to claim 11, Zimmerman discloses the light circulation device [300] comprises a hollow cavity [figure 9].

Regarding claim 12, Zimmerman discloses the light extraction means [426] comprises a light collimating structure [column 13, line 60-column 14, line 4].

In regard to claim 13, Zimmerman discloses the light extraction means [426] comprises a compound parabolic collimator [column 13, line 60-column 14, line 4].

Regarding claim 14, Zimmerman discloses the light extraction means [446] comprises a prismatic optical component [figure 12; column 14, lines 17-49].

In regard to claim 15, Zimmerman discloses a reflective polarizer [310] disposed in an optical path between the light extraction area [304] and the light extraction means [air outside of the light circulation device 302 in figure 9], wherein the light circulation device [302] includes at least one diffusing reflector disposed at a sidewall thereof [column 8, line 51-column 9, line 57].

Regarding claim 17, Zimmerman discloses the light circulation device [122] includes at least two light receiving surfaces [123; figure 4A] and the incoherent solid state light source [106] includes at least two light-emitting components [figures 4A and 4B], each light-emitting component being disposed adjacent to and confronting a corresponding one of the light receiving surfaces [figures 4A and 4B].

Regarding claim 19, Zimmerman discloses:

> a second incoherent solid state light source [106] adapted to emit light over at least a second light emission surface [figures 4A and 4B],
>
> wherein the light circulation device includes at least a second light receiving surface [123] adapted to receive the light from the second incoherent solid state light source [figure 4B], and
>
> wherein the two incoherent solid state light sources [both 106] each emit light having a different spectral color [column 6, lines 55-66].

In regard to claim 20, Zimmerman discloses the incoherent solid state light source [106] consists of a single extended LED [figures 3A and 3B; wherein "extended" indicates the solid state light source has a surface area].

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4, 7, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmerman 6,869,206).

In regard to claims 4 and 7, as applied to claims 1 and 5, respectively, Zimmerman discloses the light extraction aperture [104] has a rectangular shape [column 7, lines 49-57] and has aspect ratio of 3:4 [column 22, lines 5-6]. However, Zimmerman does not disclose an aspect ratio of 16:9. It would have been an obvious matter of design choice to choose an aspect ratio of 16:9 since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 ((CPA 1955). One would be motivated to do so because it is well-known in the art that liquid crystal displays typically have an aspect ration of 16:9.

Regarding claim 16, Zimmerman discloses the light circulation device [302] includes at least one specular reflector disposed at a sidewall thereof [column 8, line 51-column 9, line 57], said illumination device further comprising: a reflective polarizer [310] disposed in an optical path between the light extraction area and the light extraction means [figure 9; column 12, lines 48-67]. However, Zimmerman does not disclose a quarter wavelength foil in an optical path between the specular reflector and the reflective polarizer. It would have been obvious to one of ordinary skill in the art at the time of the invention to try a quarter wavelength foil in an optical path between the specular reflector and the

reflective polarizer in an attempt to achieve a desired light output, as a person with ordinary skill has good reason to pursue the known options within his or her technical grasp. In turn, one would have been motivated to do so because a light circulation device having a quarter wavelength foil in an optical path between the specular reflector and the reflective polarizer as claimed has the properties predicted by the prior art. *KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (2007).*

In regard to claim 18, Zimmerman discloses the light circulation device [426] has a cross-section who thickness is less near the light receiving surface than at the light extraction area. However, Zimmerman does not disclose a light circulation device having a cross-section with a thickness that is less near the light extraction area than at the light receiving surface. It would have been obvious to one of ordinary skill in the art at the time of the invention to try a light circulation device having a cross-section with a thickness that is less near the light extraction area than at the light receiving surface in an attempt to improve the desirability and versatility of the light circulation device, as a person with ordinary skill has good reason to pursue the known options within his or her technical grasp. One would have been motivated to do so because a light circulation device having a cross-section with a thickness that is less near the light extraction area than at the light receiving surface would produce a desired light output and has the properties predicted by the prior art. *KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (2007).*

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following are cited as disclosing a illumination device comprising at least an incoherent solid state light source and a reflective cavity:

- Wheeler et al. (US 6,045,238)
- Cassarly et al. (US 6,488,389)
- Beeson et al. (US 6,960,872)
- Beeson et al. (US 7,048,385)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEAH S. LOVELL whose telephone number is (571)272-2719. The examiner can normally be reached on Monday through Friday 8 a.m. until 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leah Lovell
Examiner
5 September 2008

/Jong-Suk (James) Lee/
Supervisory Patent Examiner, Art Unit 2885